

SENATE BILL 1505

ENVIRONMENTAL STANDARDS FOR HYDROGEN PRODUCTION

WORKSHOPS

Sacramento: September 18, 2007

El Monte: September 19, 2007



Workshop Agenda

Part One

(10:00 - 11:00)

Bill Overview
Question and Answer

Part Two

(11:00 – 12:00)

Current Status
Definitions
Question and Answer

~Break (10 min)~

Part Three

(12:10 – 1:00)

Timeline and Next Steps
Question and Answer



Goals

- ✓ Present overview of Senate Bill 1505
- ✓ Current status
- ✓ Present timeline
- ✓ Discuss questions and suggestions for development of regulation

Part one

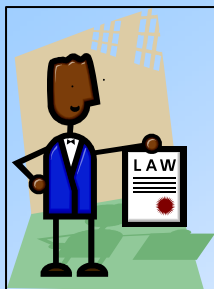
Senate Bill 1505 Overview

Overview

- Bill chaptered into Health and Safety codes September 2006 (sections 43868 & 43869)
- Implement the California Hydrogen Highway Blueprint Plan in a clean and environmentally responsible manner
- Outline environmental goals for the production of hydrogen
- Adopt regulations no later than July 1, 2008

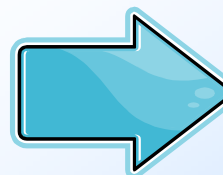


Implementation



All new state
funded stations
once enacted

3500 metric tons dispensed



All
California
stations

* Measured in a 12-month period (3,500 metric tons = 3.5 million kilograms)

Emissions Requirements

- Main requirements:
 - 30% reduction in greenhouse gas (GHG) emissions well-to-wheel (WTW)
 - 50% reduction in oxides of nitrogen (NOx) and reactive organic gases (ROG) well-to-tank (WTT)
 - No increase in toxic air contaminants (TAC)



Renewable Requirement

- 33.3% of the total energy used for production, and dispensing must come from *eligible renewable energy resources*.*

* *Eligible renewable energy resources*, as defined in Section 25741 of the Public Resources Code, are suitable for satisfying this requirement only if they have NOT already been counted toward meeting the State's renewable portfolio standard, specified in Section 399.12 of the Public Utilities Code.

Reporting Requirements

- All hydrogen providers report:
 - Annual mass of hydrogen dispensed or produced
 - Production method
 - Delivery method
- Emissions
- Renewables



Measurement of Hydrogen Dispensed

- Current methods of measurement are $\pm 10\%$ accurate at best.
 - Flow meter at the dispenser
 - Extrapolate from pressure differential with mobile fuelers
- Development of a measurement standard for BOE taxation purposes is a few years away.



Exemptions

Pre Threshold – State Funded Stations

- Exempt demonstration or temporary stations for up to five years.
- Exempt public transit operators from renewable requirement for up to 5 years based on feasibility.
- Reduce renewable requirement up to 10% based on availability of hydrogen from eligible renewable resources.

Exemptions




Post Threshold – All Stations

- Exempt facilities that dispense 100 kg/month or less for up to 5 years.
- Increase the 3,500 tonne threshold by no more than 1,500 tonnes if:
 - Threshold is reached before 1/1/2011,
 - Threshold reached by mostly HD vehicles, or
 - Increasing threshold would accelerate FCV deployment

* Average annual mass from exempted facilities < 10% of total annual mass



Other Requirements

- Review renewable and emission requirements every four years. 
- Produce a handbook to inform and educate involved parties on the requirements set forth. 
- Get input from Cal EPA's Environmental Justice Committee annually.
- Recommend incentives for spurring the development of clean sources of hydrogen by 1/1/2010. 



Questions



**SB 1505
Overview**

Part Two

Current Status & Definitions

Fuel Cell Vehicles

- Current estimated FCV's in California ~100
- Vehicles mandated by ZEV Regulation - Alternative compliance path

Vehicle years	2005-2009	2009-2011	2012-2014	2015-2017
Number of FCV	250	2500	25,000	50,000



Hydrogen Buses

As mandated by ZBus Regulation

Vehicle years	2007-2010	2012	2015	2026
Number of ZBuses	12	80	360	1150



Estimated hydrogen vehicles at threshold

Vehicles type	Vehicle miles traveled/ year	Estimated miles per kg	Kg per year
Transit bus	30,000	7 ¹	4,285
Passenger car	12,500	50	250

$3,500,000 \text{ kg} / 4,285 \text{ kg/bus} = 816 \text{ transit buses}$

$3,500,000 \text{ kg} / 250 \text{ kg/car} = 14,000 \text{ passenger cars}$

1. DOE Hydrogen Fuel Cell bus evaluation data

(http://www1.eere.energy.gov/hydrogenandfuelcells/tech_validation/ca_transit_agencies.html)

Number of Hydrogen Stations

- Types of stations currently open or planned to open by end of 2007:
 - 2 on-site steam methane reformer (SMR) (155 kg/day)
 - 5 Liquid H₂ delivered from SMR plant (830 kg/day)
 - 12 on-site electrolysis (340 kg/day)
 - 2 on-site ATR of natural gas (40 kg/day)
 - 6 delivered via mobile fueler (600 kg/day)
- Maximum estimated dispensing capacity
 - 717 metric tons per year (~20% of threshold)
- Estimated actual hydrogen throughput
 - 152 metric tons (~ 4% of threshold)



Questions



**Hydrogen
Infrastructure
Status**

Definitions

- Average new gasoline vehicle
- Average hydrogen powered vehicle
- Eligible renewable energy resources
- Average motor gasoline

Average New Gasoline Vehicle

- Baseline for comparing WTW emissions for GHGs
- Based on new gasoline vehicles available when threshold is reached and updated every 2-3 years
- Moving target - emissions could improve over time
- Use ARB's EMFAC system to estimate "average new vehicle" emissions and mileage.
- Will include new model year fleet average of passenger cars, light duty trucks and MDVs.



Average Hydrogen Powered Vehicle

- Hydrogen powered fuel cell vehicle (FCV)
 - Zero emissions – all emissions occur in fuel cycle (WTT)
- Hydrogen powered internal combustion engine (HICE) - Minimal emissions of NOx
- FCV and HICE mix - depends on mix of hydrogen powered vehicles on road



Eligible Renewable Energy Resources

- Resources deemed renewable as defined in Section 25741 of the Public Resources Code:
 - Biomass, solar thermal, photovoltaic, wind, geothermal, small hydro (<30 MW), fuel cell using renewable fuels, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current
- Electricity generated In-state* from any of the above renewable resources. (*PRC Section 25741)
- Renewable energy credits that have NOT already been counted toward meeting a utility's RPS obligation – verified through Western Renewable Energy Generation Information System
www.wregis.org.



Average Motor Gasoline

- Will be used for comparison of WTT emissions of NO_x and ROG as well as TACs
- Defined as ARB California Reformulated Gasoline 3
- Emissions calculated using widely-accepted models



Questions



Definitions

Part Three

Timeline and next steps

Timeline



- November 14, 2007
 - Workshop (Sacramento: Sierra Hearing Room)
 - 3:00-5:30
- Date TBD Cal/EPA EJC
- January 2008
 - Develop Initial Statement of Reasons (ISOR)
- March 7, 2008
 - Release ISOR for 45 day public comment period
- April 2008
 - Board Hearing

Next steps

- Staff shall develop reporting method for amount of hydrogen produced or dispensed and method of production
- Staff shall determine the method of emissions verification and reporting
- Staff will work with other developers of similar regulations to ensure overlap and unequal requirements are avoided
- Staff will work with impacted parties to ensure that the regulation is developed in a feasible manner, which meets the intent of the bill



Questions



**Timeline and
Next Steps**

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Website location and Instructions for list serve:

<http://www.arb.ca.gov/msprog/hydprod/hydprod.htm>

